DOCUMENT RESUME

ED 306 220 TM 012 604

AUTHOR Enger, John M.; Howerton, D. Lynn
TITLE Performance on the 1988 GED Tests by Graduating High School Seniors and Adult GED Examinees. Report No. 88-831.
INSTITUTION American Council on Education, Washington, D.C. General Educational Development Testing Service.
PUB DATE Aug 88
NOTE 43p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Adult Education; *Adults; Comparative Analysis; *Equivalency Tests; Essay Tests; *Graduation Requirements; High School Equivalency Programs; High Schools; *High School Seniors; Multiple Choice Tests; National Norms; National Programs; Testing Programs; *Test Results
IDENTIFIERS *General Educational Development Tests

ABSTRACT

The results of two nationwide administrations of the 1988 General Educational Development (GED) tests were compared. The first, a norming study, was based on 34,548 GED tests taken by graduating high school seniors. The second study was based on 55,154 GED test item sets administered to adult examinees who had taken the test for diploma equivalency. In general, the adults who passed the GED tests performed similarly to the graduating high school seniors on all GED tests. Both these groups significantly outperformed the GED failing group on each of the five multiple-choice tests. Observed results were similar for the essay test, but no significant differences were noted. Subtest analyses on the multiple-choice tests classified each by content area and cognitive level or item type. No significant differences were noted between seniors and adults who passed the GED. In most of these analyses, both the seniors and the adult pass group significantly outperformed the GEDT fail group. The results support use of the 1988 GED tests for awarding high school diploma equivalency credentials. Five tables and 12 figures are included. (SLD)

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Report Number 88-831

August 1988

TM012684

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Performance on the 1988 GED Tests by Graduating High School Seniors and Adult GED Examinees

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Abstract

This report compares the results from two nationwide administrations of the 1988 GED Tests. The first, a norming study, was based on 34,548 GED Tests taken by graduating high school seniors. The second study was based on 55,154 GED Test item sets administered to adult GED examinees who had just completed a GED Test, taken for diploma equivalency. The performance of the GED examinees was divided into those who passed and those who failed the corresponding GED Test.

In general, the GED Pass group performed similarly to the graduating high school seniors on all GED Tests. Both of these groups significantly outperformed the GED Fail group on each of the five multiple choice tests. Although the observed results were similar for the essay test, no significant differences were noted.

Subtest analyses were conducted on each of the five multiple choice GED Tests. Items were classified by (1) content area and (2) cognitive level or item type. No significant differences were noted between the high school seniors and the GED Pass group on the subtests. In most of these analyses, the high school seniors and GED Pass group significantly outperformed the GED Fail group.

The findings of this study are generally consistent with an earlier study conducted on the previous edition of the GED Tests. The use of the 1988 GED Tests for awarding high school diploma equivalency credentials is supported by this study, since comparable performance was noted between the graduating high school seniors and the GED Pass group.

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Performance on the 1988 GED Tests by Graduating High School Seniors and Adult GED Examinees

Introduction

Since 1942 the Tests of General Educational Development (GED Tests) have served as the basis for credentialing millions of Americans from the United States and Canada with a high school "equivalency" diploma. The GED test battery consists of five tests which measure the major concepts and lasting outcomes of a high school education. The five tests are: (1) Writing Skills, (2) Social Studies, (3) Science, (4) Interpreting Literature and the Arts, and (5) Mathematics.

GED Tests Administered and Credentials Issued

Based on statistical reports available since 1949, the GED Tests have been administered to 12,646,687 adults (GEDTS, 1987). From 1971 to 1986, high school equivalency credentials have been awarded to 6,271,915 adults of the 10,327,002 examinees who took the tests representing a 60.1 percent pass rate over these 16 years.

In 1986, there were 3,243 GED testing centers. At these centers 739,683 examinees took the GED Tests and 451,294 were awarded high school equivalency credentials (61.0 percent). The average age of the 1986 examinees was 26.5 years. They had 9.9 years of formal schooling and 54.2 percent of the examinees indicated plans to continue their studies.

Development of the GED Tests

The GED Tests are a result of the efforts of national advisory committees, the GED staff at the American Council on Education in Washington, D.C., and item writers from around the country. An advisory committee, comprised of curriculum and adult education experts from throughout the country, guide the development of the GED Tests (GED Testing Service, 1984). For the 1988 GED Tests, this advisory committee reviewed high school curricula nationwide and made recommendations on content and format of the tests.

The advisory committee recommendations formed the specifications or blueprints for construction of the GED Tests (Whitney et al, 1985). There were two distinct changes in the specifications of the 1988 GED Test battery: (1) only items written at cognitive levels of comprehension or higher were included (i.e., there were no knowledge level items as in previous editions), and (2) a writing exercise (essay) was included as Part II of the Writing Skills Test.

Working within the framework of these test specifications, the GED staff and editors for each of the five GED Tests compiled hundreds of test items. These items originated from previous GED Tests, the GED staff, and from a pool of items constructed and submitted by test-item writers. Items were then administered on a tryout basis in GED testing centers throughout the United States and Canada. From the results of these tryouts, items were revised and selected for inclusion in the five GED Tests.

For the writing portion of the test, essay topics were developed and administered. A scoring guide was developed for readers to score the essays. Reliability and validity studies were conducted to document that the essay test: (1) measures skills distinct from the writing skills multiple choice test, (2) measures writing skills directly rather than indirectly, and (3) can be scored with acceptable degrees of reliability (Swartz, Whitney & Patience, 1985).

Standardization of the GED Tests

Since 1942, GED Tests have been normed on the performance of contemporary high school seniors (Malizio & Whitney, 1982). The relationship between the number of items correctly answered on each test and percentile rank scales have been determined in norming studies conducted in 1955, 1967, 1977, 1980, and 1987. The scores which will be reported to examinees taking the 1988 GED Tests are based on the results of the 1987 standardization of the GED Tests conducted on graduating high school seniors in the spring of 1987. The results presented in this report are based on data collected in a pre-standardization study conducted in 1985 and 1986.

High School Diploma Equivalency of the GED Tests

High school equivalency credentials are awarded by state-level departments of education in all 50 states, the District of Columbia, six territories of the United States, and in ten territories and provinces of Canada. The GED diploma equivalency is based on: (1) carefully defined test content to represent knowledge and skills acquired from high school level study, and (2) test score scales and passing scores determined by the performance of graduating high school seniors on the GED Tests. The justification for GED diploma equivalency is thoroughly described in The Official Teacher's Guide to The Tests of General Educational Development (Swartz, Patience, Downey, Manly, Metcalf, & Robinson, 1987).

To achieve an equivalency diploma, the GED examinee is required to meet or surpass the performance of about 27 to 30 percent of recent high school graduates. The minimum score requirements on the GED Tests for awarding high school equivalency credentials vary somewhat by state, province and territory and are given in Table 8 in The 1986 GED Statistical Report (GEDTS, 1987). Reliability (internal consistency and parallel forms) and validity (content, concurrent and predictive) studies justifying the diploma equivalency credentials for GED Tests have been summarized by Whitney, Malizio and Patience (1986).

Purpose of the Study

The purpose of this study was to compare the performance of adult GED examinees to graduating high school seniors on representative items from the 1988 GED Tests. In order to make appropriate comparisons to high school seniors, the adult GED examinee performance on tryout items from the 1988 GED Tests was analyzed for three groups. These groups were: (1) the GED Pass group, those who passed the pre-1988 version of the corresponding GED Test, (2) the GED Fail group, those who failed the test; and (3) GED Examinees, the combined group of all adult GED examinees.

Three levels of analyses were made. First, each group's overall performance was compared on each of the five GED Tests, such as the Science Test. Second, each group's performance was compared on content areas of each of the five GED Tests. For example, group performance was compared on the four content areas of the GED Science Test: (1) biology, (2) earth science, (3) physics, and (4) chemistry. Third, group performance was compared on items grouped by cognitive level or item type for each of the five GED Tests. For example, comparisons were made on the four cognitive levels of the GED Science Test: (1) comprehension, (2) application, (3) analysis, and (4) evaluation. A brief description of each of the five GED Tests follows.

The 1988 GED Tests

The entire 1988 GED Test battery contains a total of 287 multiple choice items and one essay exercise. Allotted time for the five-test battery is 7 hours 35 minutes. Table 1 displays the table of specifications for the five tests in the battery. Listed in the table are the number of questions and time allotted for each test. For each of the five multiple choice tests, the proportion of items classified by content area and by cognitive level or item type are also shown in Table 1. A more detailed description can be found in The Official Teacher's Guide to The Tests of General Educational Development (Swartz et al, 1987).

Table 1

Table of Specifications for the 1988 GED Tests

GED Test	Number of Items	Content Area	Item Type or Cognitive Level
Writing Skills (120 min.)			
Part I (75 min.)	55	Sentence Structure (35%) Usage (35%) Mechanics (30%)	Sentence Correction (50%) Sentence Revision (35%) Construction Shift (15%)
Part II (45 min.)	one essay	Single Topic	Opinion or Explanation
Social Studies (85 min.)	64	History (25%) Economics (20%) Political Science (20%) Geography (15%) Behavioral Science (20%)	Comprehension (20%) Application (30%) Analysis (30%) Evaluation (20%)
Science (95 min.)	66	Life Science Biology (50%) Physical Science Earth Science (20%) Physics (15%) Chemistry (15%)	Comprehension (20%) Application (30%) Analysis (30%) Evaluation (20%)
Interpreting Literature and the Arts (65 min.)	45	Popular Literature (50%) Classical Literature (25%) Commentary About Literature and the Arts (25%)	Comprehension (60%) Application (15%) Analysis (25%)
Mathematics (90 min.)	56	Arithmetic (50%) Algebra (30%) Geometry (20%)	Set-up (25%) Solution (75%)

Writing Skills Test

An essay exercise has been added to the 1988 edition of the GED Writing Skills Test. The Writing Skills Test, Part I, is a 50-item, multiple choice test. The Writing Skills Test, Part II, is an essay test over a single topic. The multiple choice and essay tests are discussed and analyzed separately in this report. However, for the GED Writing Skills Test, only a single composite score is reported. This composite score is based on a weighted combination of the scores from the Writing Skills Test, Part I and Part II, as illustrated in The Official Teacher's Guide to The Tests of General Educational Development (Swartz et al, 1987).

Writing Skills Test, Part I (Multiple Choice). Part I of the Writing Skills Test consists of multiple-choice items which are intended to measure the knowledge and understanding of the conventions of written English. There are three content areas: (1) sentence structure, (2) usage, and (3) mechanics (spelling, punctuation and capitalization). Items are classified by three item types: (1) sentence correction, (2) sentence revision, and (3) construction shift. In taking Part I of the Writing Skills Test, the examinee must: (a) identify errors in spelling, capitalization, punctuation, diction and style, and usage; (b) recognize preferred ways of writing sentences; and (c) analyze the organization and logic of sentences within a passage.

Writing Skills Test, Part II (Essay). Part II of the Writing Skills Test (the essay test) is intended to measure the ability to compose an answer and present it effectively in written prose. This writing exercise is a new addition to the Writing Skills Test. Examinees are provided a single topic and asked to write an opinion or explanation. No specialized knowledge is required in order to respond to a topic.

The essay tests are "holistically" scored independently by two readers. Holistic scoring, often referred to as "general impression scoring", is a method of evaluating a writing sample based upon the paper's overall effectiveness (Conlan, 1976). No score is given for papers which are blank, illegible or written on another topic than the one assigned. Any examinee receiving no score on the essay portion cannot pass the Writing Skills Test, regardless of the performance on Part I. The ratings of essay responses are scored from 1 (lowest) to 6 (highest) by each reader. The two scores are combined to form a total essay score, ranging from 2 to 12. If the scores by the two readers vary by more than one point, the essay is scored by a third reader. The three scores are then averaged, doubled and rounded to produce an integer total score on the 2 to 12 scale (Swartz & Whitney, 1985).

Social Studies Test

The Social Studies Test is intended to measure the understanding of the primary concepts and principles of the social sciences, as well as, the ability to integrate information from the overall study of the social sciences. The five content areas of the Social Studies Test are: (1) history, (2) economics, (3) political science, (4) geography, and (5) behavioral science (anthropology, psychology and sociology). Both national and global concepts are included in all content areas.

Items in the Social Studies Test are classified in four cognitive levels: (1) comprehension, (2) application, (3) analysis, and (4) evaluation. In taking the Social Studies Test, the examinee must demonstrate an understanding of basic principles and concepts in each area, interpret written and graphical information, apply information and ideas, distinguish fact from opinion, draw conclusions, identify cause and effect relationships, and make judgments about information and methods.

Science Test

The Science Test is intended to measure understanding of primary concepts and principles of the life and physical sciences. In addition, the Science Test is intended to measure the ability to analyze and solve problems, explain results, interpret findings and predict outcomes for science information presented. Life Science items comprise half of the Science Test, designated as: (1) biology, 50 percent. Physical Science items comprise the other half of the Science Test, divided into three content areas: (2) earth science, 20 percent; (3) physics, 15 percent; and (4) chemistry, 15 percent.

The items in the Science Test are classified in four cognitive levels: (1) comprehension, (2) application, (3) analysis, and (4) evaluation. In taking the Science Test, the examinee must demonstrate an understanding of basic principles and ideas, use the information presented in the reading passages or questions to analyze and solve problems, explain results, and interpret given information.

Interpreting Literature and the Arts Test

The Interpreting Literature and the Arts Test in the GED five-test battery replaces the Reading Skills Test in earlier editions. The Interpreting Literature and the Arts Test is intended to measure comprehension of literature, an understanding of commentary about literature and the arts, and the ability to draw conclusions and inferences.

The content of the Interpreting Literature and the Arts Test is divided into three sections: (1) popular literature, (2) classical literature, and (3) commentary about literature and the arts. Popular and classical literature include items covering both fiction and non-fiction prose, poetry, and drama. The classical literature selections are drawn from 19th and 20th century works "which by common consent have achieved a recognized position in literary history..." (Holman, 1972). The commentary items generally pertain to reviews of literature, theater, music/dance, film and art.

The Interpreting Literature and the Arts Test items are also classified in three cognitive levels: (1) comprehension, (2) application, and (3) analysis. Both literal and inferential comprehension items are included. The literal comprehension items are designed to measure understanding of specific terms or excerpts from a passage. The inferential comprehension items are designed to measure the ability to draw inferences from (a) specific portions of a passage and (b) specific portions of a passage in relation to the overall perspective of the entire passage. In taking the Interpreting Literature and the Arts Test, the examinee must demonstrate an understanding of what is read and draw conclusions and inferences both from specific portions of a passage and from entire passages.

Mathematics Test

The Mathematics Test is designed to measure problem solving ability in three content areas: arithmetic, geometry, and algebra. The arithmetic content area items comprise 50 percent of the Mathematics Test and include items divided into the following subgroups: (1) measurement, 30 percent; (2) number relations, 10 percent; and (3) data analysis, 10 percent. The other two content areas, (4) geometry and (5) algebra, comprise the remaining 50 percent of the items, 20 percent and 30 percent respectively. Although the items in the GED Mathematics Test require skills ranging from comprehension to evaluation, most of the test items are written at the application level of the cognitive domain.

Mathematics Test items are classified by item type: (1) set-up, where the examinees are required to set up the procedures to solve the problem, and (2) solution, where examinees find the solution to the problem. Approximately two-thirds of the mathematics items have written stimuli; about one-third have graphic stimuli. In taking the Mathematics Test, the examinee must determine which computations are required to solve a problem, perform these computations, differentiate between sufficient and insufficient data, discriminate between relevant and extraneous data, and determine the sequence of steps to solve a problem.

Method

Sampling Procedures

Graduating High School Seniors. In spring 1986, a pre-standardization study was conducted on a sample drawn from the population of all 1986 graduating high school seniors. The sample was drawn from 640 secondary schools which were stratified by region of the country, by public and private schools, and by socio-economic status. The country was divided into five regions: northeast, southeast, north central, central and west. By region, 18.0 percent of the schools were drawn from the northeast region, 19.4 percent from the southeast, 18.9 percent from the north central, 23.4 percent from the central, and 20.3 percent from the west region.

In 1986 there were 16,688 public secondary schools and 7,031 private secondary schools in the United States. Thus, 70.4 percent of the secondary schools were public and 29.6 percent were private. The public schools accounted for approximately 92 percent of the secondary school students; private schools accounted for about 8 percent (Market Data Retrieval, 1986). In this pre-standardization study, public school students comprised 67.5 percent of the sample and 32.5 percent were private school students. These sample percentages are similar to national public and private school representation. However, student representation in the sample is not similar to the proportions of public and private school students nationally. A higher proportion of private school students were included in the sample than were in the population.

Schools were also stratified by socio-economic status based on the percent of the population at or below poverty level. For the public schools, four levels of socio-economic status were determined by the percent of students receiving free lunches. Sixteen public schools were not classified by socio-economic level. For the 416 public schools which were classified by socio-economic status, 9.6 percent of these schools had 0-4.9 percent of students receiving free lunches, 31.7 percent had 5-11.9 percent, 41.6 percent had 12-24.9 percent, and 17.1 percent had 25 percent or more. None of the private schools were classified by socio-economic level.

Adult GED Examinees. In 1985, there were 711,392 adults who took the GED Tests at 3,371 GED testing centers. Over a two to three month period according to a pre-arranged schedule, GED examinees at the testing centers were asked to complete an extra test booklet containing tryout items for the 1988 GED Tests. These item tryout studies were conducted in 16 states in spring, 1985; 16 states in fall, 1985; and 9 states in spring, 1986. (See Appendix.)

Sample Characteristics

Graduating High School Seniors. There were 34,548 graduating high school seniors participating in the 1986 pre-standardization study of the 1988 GED Tests. Students who participated in this study, but did not graduate from high school, were not included in the sample. Prior to taking the GED Test items, students were asked to complete a questionnaire to report background information about themselves. The background information requested included: sex; race; years of study; courses taken in English, social studies, science and mathematics; and plans after graduation.

As shown in Table 2, 50.9 percent of the graduating high school seniors were female and 49.1 percent male. By racial background, 76.9 percent of the sample of graduating high school seniors were white, 16.1 percent were black and 7.0 percent indicated another racial background (Alaskan Native, American Indian, Asian, Pacific Islander or other). Of the total, 6.2 percent indicated a Spanish or Hispanic origin or descent.

Also, from Table 2, 98.7 percent of the graduating high school seniors had taken three or more years of English from Grade 9 through Grade 12. In social studies, 79.4 percent had taken three or more years, 51.7 percent in science, and 72.6 percent in mathematics. The proportion of seniors completing four or more years were: 86.1 percent in English, 32.4 percent in social studies, 21.7 percent in science, and 38.4 percent in mathematics.

The breakdown of courses taken by subject area are also listed in Table 2. The most frequently reported courses taken in each area were: Grammar/Composition in English, U.S. History in social studies, Biology in science, and Algebra I in mathematics.

The graduating high school seniors in the 1986 pre-standardization study were also asked about their plans for the first year after graduation. As shown in Table 2, 94.5 percent indicated plans for the coming year and 5.5 indicated "No plans." Of those who had plans, 52.5 percent planned to work part-time and 28.2 percent full-time. Also, of those indicating plans for the year following graduation, 64.5 percent planned to go to college, 14.8 percent planned to attend vocational/technical school, and 10.9 percent would enter military service.

Adult GED Examinees. There were 55,154 adult GED examinees who participated in the study. The numbers of examinees who completed tryout items from the 1988 GED Tests were: 15,566 in spring, 1985; 19,000 in fall, 1985; and 20,588 in spring, 1986. Prior to taking the tryout items, examinees completed a questionnaire which requested information on sex, race, age, and highest grade completed.

The background information for the adult GED examinees is summarized in Table 3. In the sample, 55.6 percent were female and 44.4 percent male. By racial background, 72.3 percent were white,

Table 2

Characteristics of the 1986 Graduating High School Seniors in the 1986 GED Pre-standardization Study (N = 34,548)

Sex and Racial Background

Sex	Percent
Female	50.9
Male	49.1

Racial Background	Percent
Alaskan Native	.2
American Indian	.9
Asian	1.3
Black	16.1
Pacific Islander	.8
White	76.9
Other	3.8
Hispanic	6.2
Non-hispanic	93.8

Years of Study Completed by Subject

	Percent of Seniors Completing:				
Subject	1 year Or less	2 years	3 years	4 years	More Than 4 years
English	.2	1.1	12.6	81.6	4.5
Social Studies	2.7	17.9	47.0	29.3	3.1
Science	11.4	36.9	30.0	18.2	3.5
Mathematics	3.1	24.3	34.2	32.3	6.1

Table 2, Continued

Characteristics of the 1986 Graduating High School Seniors in the 1986 GED Pre-standardization Study (N = 34,548)

Type of Course Taken by Subject

English	Percent	Social Studies	Percent
American Literature	52.1	Behavioral Science	16.7
British Literature	47.3	Civics	45.0
Grammar/Composition	87.0	Economics	55.0
World Literature	33.4	Geography	27.7
Other	10.2	Political Science	25.0
		U.S. History	90.1
		World History	61.8
		Other	18.2
Science		**Mathematics**	
Biology	84.9	Algebra I	60.5
Chemistry	41.6	Algebra II	48.2
Earth Science	30.9	Business Mathematics	18.8
General Science	40.7	Calculus	8.3
Genetics	2.7	General Mathematics	40.4
Physical Science	34.1	Geometry	54.6
Physics	17.6	Trigonometry	22.6
Zoology/Botany	5.0	Other	17.6
Other	12.4		

Plans for First Year After Graduation

Plans	Percent	Study Plans	Percent
None	5.5	Community or Junior College	23.7
		Technical or Vocational School	14.8
Part-time Work	52.5	4-year College or University	40.8
Full-time Work	28.2	On-the-job Training	15.4
		Military	10.9
		Other	6.5

Table 3

Characteristics of the Adult GED Examinees (N = 55,154)

Sex	Percent
Female	55.6
Male	44.4

Racial Background	Percent
American Indian/Alaskan Native	2.9
Asian/Pacific Islander	2.0
Black	19.6
Chicano/Mexican American	3.2
White	72.3
Hispanic	11.8
Non-hispanic	88.2

Age in Years	Percent
60 or older	.5
50-59	2.6
40-49	7.4
30-39	16.8
20-29	40.8
16-19	31.9

Highest Grade Completed	Percent
Grade 12	5.2
11	31.8
10	31.5
9	19.4
8	8.9
7	2.1
6 or lower	1.1

19.6 percent black, and 8.1 percent indicated another racial background (Alaskan Native, American Indian, Asian, Pacific Islander, and Chicano or Mexican American). Of the total, 11.8 percent indicated a Hispanic background.

Half of the sample of adult GED examinees was 23 years of age or older. The mean age was 26.0 years. The age distribution for adult GED examinees was: 31.9 percent in their teens, 40.8 percent in their twenties, 16.8 percent in their thirties, and 10.5 percent were 40 years of age or older.

Of the adult GED examinees, 1.1 percent indicated they had not completed a grade at the secondary level of school. Of the adult GED examinees who had completed a grade at the secondary level: 98.9 percent had completed the seventh grade or higher, 96.8 percent had completed the eighth grade or higher, 87.9 percent the ninth grade or higher, 68.5 percent the tenth grade or higher, 37.0 percent the eleventh grade or higher, and 5.2 percent had completed the twelfth grade.

The average age and average years of formal schooling of the sample of adult GED examinees in this study is comparable to all GED adult examinees tested in 1986. The average age of this sample was 26.0 years and the average age of all 1986 adult GED examinees was 26.5 years (GEDTS, 1987). Both the sample group and all 1986 examinees reported an average of 9.9 years of formal schooling.

Administration of the GED Tests and Tryout Item Sets

Graduating High School Seniors. After the graduating high school seniors had completed the questionnaire on background information, they took one, two, three or four sets of items from GED Tests. Some of the seniors took items from one test (say Social Studies) with items selected from both the previous edition and the 1988 edition. These administrations were designed to compare performance on the 1988 GED Tests with performance on the previous edition. In order to validate parallel forms for the 1988 GED Tests, some seniors took items from two forms of one of the 1988 tests, such as two forms of the new Social Studies Test.

Other seniors took sets of items from two different tests in the GED Test battery. For example, a senior may have taken one form of the Social Studies Test and one form of the Science Test. Some seniors took one multiple choice form in one of the five content areas (Writing Skills, Social Studies, Science, Interpreting Literature and the Arts, and Mathematics) and one essay exercise. Finally, some seniors took only one multiple choice test or one essay exercise.

The order in which the tests were taken was counterbalanced to control for confounding effects of the sequence taken. For example, some seniors took two different forms of the Social Studies Test and other seniors took the same tests in reverse order. The

number of items administered to the seniors in Forms A, B and C appears in Table 4. In the pre-standardization study, Form A served as the anchor test to previous editions of the GED Tests. There were also a total of 17 essay exercises administered. A total of 34,548 graduating senior test administrations were included in the pre-standardization study. There were more than 5,000 test administrations for each GED Test.

Adult GED Examinees. The adult GED examinees participating in this study were a sample of those who took GED Tests for diploma equivalency during test periods in the spring and fall of 1985 and the spring of 1986. After taking a GED Test in one of the five content areas, these adult examinees were asked to complete the background questionnaire. Next these examinees took a set of tryout items from the 1988 GED Test in the same content area as the GED Test they had just completed.

Throughout the three testing periods, the adult GED examinees took various sets of items for the five GED Tests. As shown in Table 5, an average of 19 to 23 items were administered in 22 to 34 tryout sets for the five multiple choice tests. For the essay portion of the Writing Skills Test, GED examinees took one of 15 tryout essay items. A total of 55,154 adult GED examinee test administrations were included in the tryout of items for the 1988 GED Tests.

Data Record Files

Graduating High School Seniors. The data file contained 34,548 records for the graduating high school seniors in the pre-standardization study of the 1988 GED Tests. The number of records for each senior corresponded to the number of GED Tests that senior had taken. Each record was coded with the demographic information presented in Table 2.

Adult GED Examinees. For the adult GED examinees, there were 55,154 records contained on three data files from the three testing periods: spring, 1985; fall, 1985; and spring, 1986. Each record was coded with the demographic information presented in Table 3. In addition, record files for the adult GED examinees included test information on tryout item sets from the 1988 GED Tests and the standard score of the corresponding GED Tests on the previous edition.

Test Analysis Procedures

Graduating High School Seniors. For each of the five 1988 GED Tests, the correct item responses of all multiple choice items were tallied. These tallies were converted to percent correct (the percentage of students answering an item correctly) to determine the item difficulty of each item. From the distribution of item difficulties for each test, the average percent correct (Mean %) and standard deviation (SD) were computed.

Table 4

Number of Items in the 1988 GED Tests
Taken by Graduating High School Seniors

1988 GED Test	Form A Items	Form A N	Form B Items	Form B N	Form C Items	Form C N	Total Number of H.S. Seniors
Writing Skills, Part I	80	1209	50	3256	50	1156	5621
Social Studies	60	201	60	3217	60	2220	5638
Science	60	196	60	3279	60	2254	5729
Interpreting Literature and the Arts*	40	211	47	3295	46	2262	5768
Mathematics	50	193	50	3183	50	2184	5560
Writing Skills, Part II	(17 essay items administered)						6232
Total		2010		16,230		10,076	34,548

*Reading Skills Test in previous edition.

Table 5

Average Number of Items in Tryout Sets of the 1988
GED Tests Taken by Adult GED Examinees

Multiple Choice Items	Average Number of Items	No. of Tryout Sets	Number of Adult GED Examinees
Writing Skills	20	22	8,640
Social Studies	19	32	11,241
Science	20	24	9,805
Interpreting Literature and the Arts	22	24	10,521
Mathematics	23	34	10,808
Essay Item			
Writing Exercise	1	15	4,139
			55,154

The standard error of the distribution of item difficulties was calculated for each test and was based on a sample size equal to the number of items on the test, given in Table 4. To determine the 99 percent confidence interval about the mean percent correct for each test, the standard error was multiplied by 2.58 then added to and subtracted from the mean percent. Bands representing the 99 percent confidence intervals were graphed for each test and subtest (see Malizio & Whitney, 1982). Only items taken in common by both the seniors and GED examinees were included in these analyses.

Similar analyses were performed on subtests of the five GED multiple choice tests, based on (1) content area and (2) cognitive level or item type. Subtest analyses were based on the number of items taken in common by both the high school seniors and the adult GED examinees.

The results of the essay exercises administered in Part II of the Writing Skills Test are based on a scale of 2 to 12 points. The four essay exercises included in the analysis were only those which were: (1) taken in common by both graduating seniors and GED examinees, and (2) subsequently accepted for operational use in the GED Tests. The mean essay score (Mean), standard deviation (SD) and 99 percent confidence interval about the mean were determined.

Adult GED Examinees. The same test analysis procedures were also performed on the results of the tryout items administered to the adult GED examinees over the three testing periods. From the distribution of item difficulties for tryout items for each test, the average percent correct (Mean %) and standard deviation (SD) were computed. The standard error of the distribution of item difficulties was calculated for each test and was based on a sample size equal to the average number of tryout items, given in Table 5. Since some items were revised, only performance on the most recent revision of a particular item was analyzed. Only multiple choice items and essay exercises taken in common by both the seniors and adult GED examinees were included in the test and subtest analyses.

In the Malizio and Whitney (1982) study, GED examinees who earned standard scores of at least 35 on each of the five tests and an average of 45 on the entire battery were called "GED Graduates." This group is comparable to the GED Pass group in the present study: those GED examinees who had a standard score of 40 or more on the operational GED Test. The GED Fail group had standard scores less than 40. This minimum score requirement for passing the GED Test was based on a policy recommendation by the Commission on Educational Credit and Credentials (1981). The GED Pass group and GED Fail group combine to form "GED Examinees."

Results

Figure 1 contrasts the performance of graduating high school seniors and adult GED examinees on multiple choice items from the five GED Tests: (1) Writing Skills Test, Part I; (2) Social Studies Test; (3) Science Test; (4) Interpreting Literature and the Arts Test; and (5) Mathematics Test. The mean percent of items answered correctly (Mean %), standard deviation (SD), and 99 percent confidence interval are given for each test. Performance for all adult GED examinees (GED Examinees) has been further subdivided into those who passed (GED Pass) and failed (GED Fail) the operational GED Test which the examinees were taking for diploma equivalency.

On the five multiple choice tests, the H.S. Seniors averaged 58 to 65 percent of the items answered correctly, as shown in Figure 1. Since all the multiple choice items had five choices, the chance score was 20 percent. Thus, H.S. Seniors average performance was in the middle of the effective range between 20 and 100 percent (chance and perfect score). Therefore, the items were neither too difficult nor too easy for the H.S. Seniors. The middle difficulty of the items provides for maximum discrimination of examinee performance relative to the group.

Compared with the H.S. Seniors, the GED Pass group on the average answered within 1 to 6 percent of the items correctly on each of the five multiple choice tests. Compared to the H.S. Seniors, the GED Pass group answered 6 percent more items correctly on the Social Studies Test, 5 percent more on the Interpreting Literature and the Arts Test, and 3 percent more on the Science Test. However, compared to the GED Pass group, the H.S. Seniors answered 6 percent more items correctly on the Mathematics Test and 1 percent more on the Writing Skills Test, Part I. For the five multiple choice tests, the differences in standard deviations ranged from 0 to 4 percent.

In Figure 1, a visual contrast of the four groups' multiple-choice test performance can be made with the 99 percent confidence bands about the respective mean percent scores. Since the 99 percent confidence bands overlap, the performances of the GED Pass group and the H.S. Seniors were not significantly different on each of the five multiple choice tests. However, the GED Pass group significantly outperformed the GED Fail group on each of the five multiple choice tests.

For reference, the performance of all GED examinees (GED Examinees) on each of the five tests is provided. Comparing the performance of the GED Examinees with those who passed (GED Pass) and failed (GED Fail) indicates a high proportion of the adult GED Examinees were in the GED Pass group.

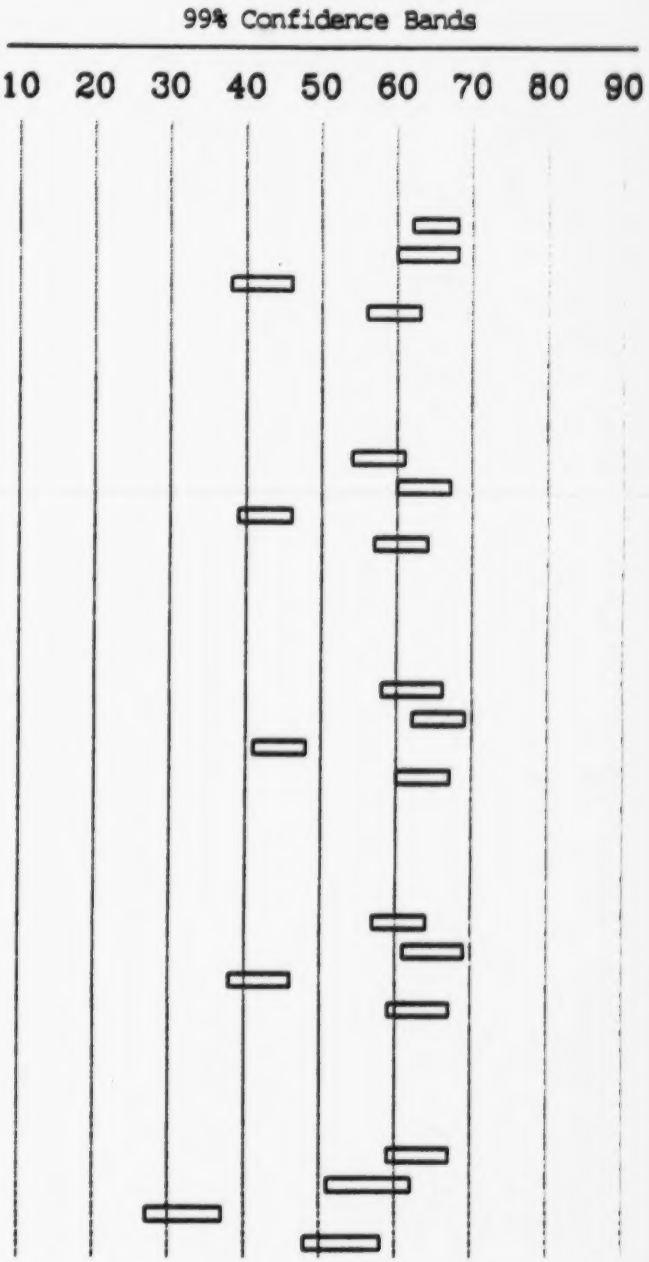
The performances of the graduating high school seniors and adult GED examinees on the essay test, Writing Skills Test, Part II, are given in Figure 2. Each essay was scored on a scale from 1 to 6 by two judges. These two ratings were combined to produce essay

Figure 1

High School Senior and GED Examinee Performance

On the 1988 GED Multiple Choice Tests[1]

Group	Mean %	SD	99 Percent Confidence Interval
Test 1 — Writing Skills, Part I			
H.S. Seniors	65	11	62 - 68
GED Pass	64	14	60 - 68
GED Fail	42	13	38 - 46
GED Examinees	60	13	56 - 63
Test 2 — Social Studies			
H.S. Seniors	58	14	54 - 61
GED Pass	64	15	60 - 67
GED Fail	42	16	39 - 46
GED Examinees	61	15	57 - 64
Test 3 — Science			
H.S. Seniors	62	14	58 - 66
GED Pass	65	14	62 - 69
GED Fail	44	13	41 - 48
GED Examinees	63	14	60 - 67
Test 4 — Interpreting Literature and the Arts			
H.S. Seniors	60	13	57 - 64
GED Pass	65	15	61 - 69
GED Fail	42	15	38 - 46
GED Examinees	63	14	59 - 67
Test 5 — Mathematics			
H.S. Seniors	63	13	59 - 67
GED Pass	57	17	51 - 62
GED Fail	32	16	27 - 37
GED Examinees	53	16	48 - 58

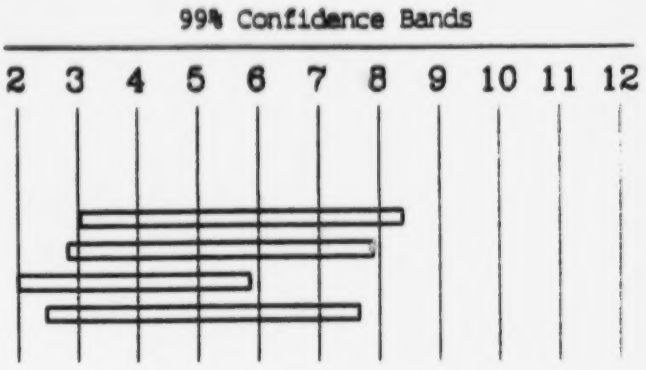


[1]For the five multiple choice tests, group performance is given as the percent of items answered correctly.

Figure 2

Writing Skills Test, Part II — The Essay Test
(Based on 2 to 12 Point Rating Scale)

Group	Mean	SD	99 Percent Confidence Interval
Test 2 — Writing Skills, Part II			
H.S. Seniors	5.71	2.07	3.04-8.38
GED Pass	5.36	1.96	2.83-7.89
GED Fail	3.76	1.62	2.00-5.85
GED Examinees	5.07	2.00	2.48-7.66



scores which ranged from 2 to 12. (Unlike the GED multiple choice tests where results are given as percent correct, the essay results are presented in Figure 2 on the 2 to 12 point rating scale.) The GED Pass group, on the average, performed similarly to the H.S. Seniors. As indicated by the overlap of the confidence bands, no significant differences were noted between groups on the ratings on the essay test.

Further analyses of each of the GED Tests follow. Results on the multiple choice tests are first broken down by content area and then analyzed by H.S. Senior and adult GED group performance. The multiple choice tests are also broken down by cognitive level or item type and group performances are similarly analyzed.

Writing Skills Test

The results on the Writing Skills Test, Part I, the multiple choice test, and Writing Skills Test, Part II, the essay test, are presented separately for analysis. However, when used for diploma equivalency, scores on these two parts are combined to form a single GED score on the Writing Skills Test.

Writing Skills Test, Part I. The results of the Writing Skills Test, Part I, are given as percent of the items answered correctly by content area in Figure 3. The last set of entries, Writing Skills -- All Content Areas, is the composite of all content areas and is the same as Test 1 -- Writing Skills, Part I in Figure 1. In Figure 3, the GED Examinees group performance is given for reference and represents the combined performance of both the GED Pass and GED Fail groups. For the Writing Skills Test, Part I, 82 percent of all adult GED Examinees were in the GED Pass group.

On the multiple choice portion of the Writing Skills Test, no significant difference was noted in average performance between the H.S. Seniors (Mean % = 65) and the GED Pass group (64). Both of these groups significantly out-performed the GED Fail group (42).

As shown in Figure 3, the significant differences noted for the Writing Skills Test, Part I, were consistent across each of the content areas. Both the H.S. Seniors and GED Pass group significantly out-performed the GED Fail group in Sentence Structure, Usage and Mechanics (spelling, punctuation and capitalization).

The breakdown of the Writing Skills Test, Part I, by item type appears in Figure 4. The last set of entries, Writing Skills -- All Item Types, is the composite of all item types and is the same as Test 1 -- Writing Skills, Part I in Figure 1 and Writing Skills--All Content Areas in Figure 3.

As shown in Figure 4, the significant differences noted for the Writing Skills Test, Part I, were also consistent across item types. Both the H.S. Seniors and GED Pass group significantly out-performed the GED Fail group in items which required Sentence Correction, Sentence Revision and Construction Shift.

Figure 3

Percent of Items Answered Correctly for
Content Areas of the Writing Skills Test, Part I

Group	Mean %	SD	99 Percent Confidence Interval
Content Area — Sentence Structure			
H.S. Seniors	65	10	60 - 70
GED Pass	65	11	60 - 71
GED Fail	41	12	35 - 47
GED Examinees	60	11	55 - 66
Content Area — Usage			
H.S. Seniors	62	12	57 - 67
GED Pass	61	14	54 - 67
GED Fail	40	13	34 - 46
GED Examinees	56	14	50 - 63
Content Area — Mechanics (spelling, punctuation, and capitalization)			
H.S. Seniors	68	11	63 - 74
GED Pass	67	15	60 - 75
GED Fail	45	15	38 - 52
GED Examinees	63	15	56 - 70
Writing Skills — All Content Areas			
H.S. Seniors	65	11	62 - 68
GED Pass	64	14	60 - 68
GED Fail	42	13	38 - 46
GED Examinees	60	13	56 - 63

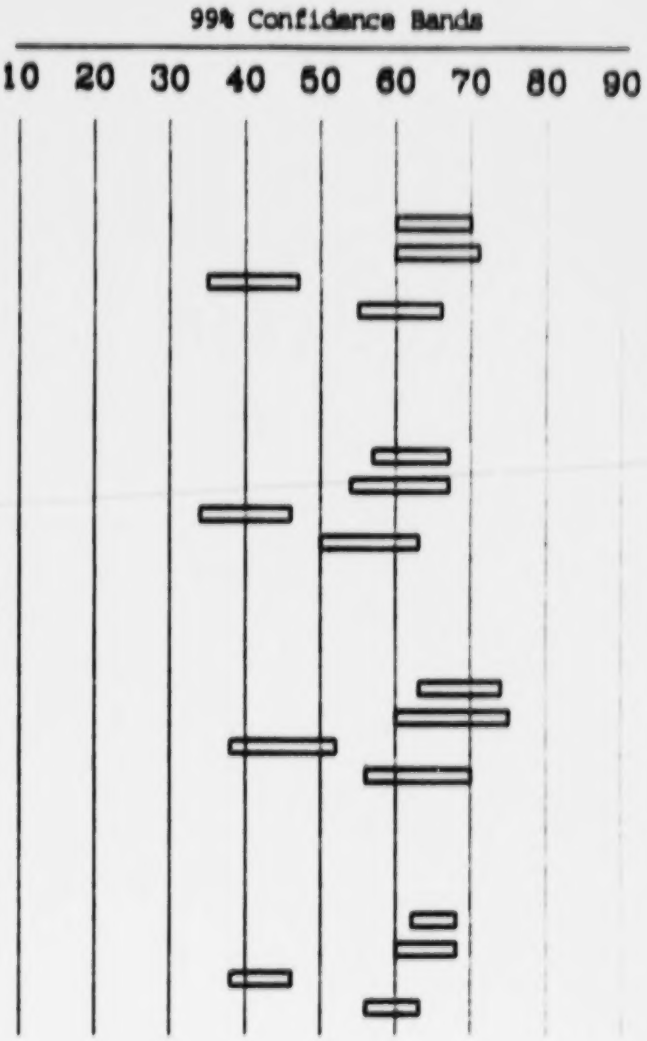
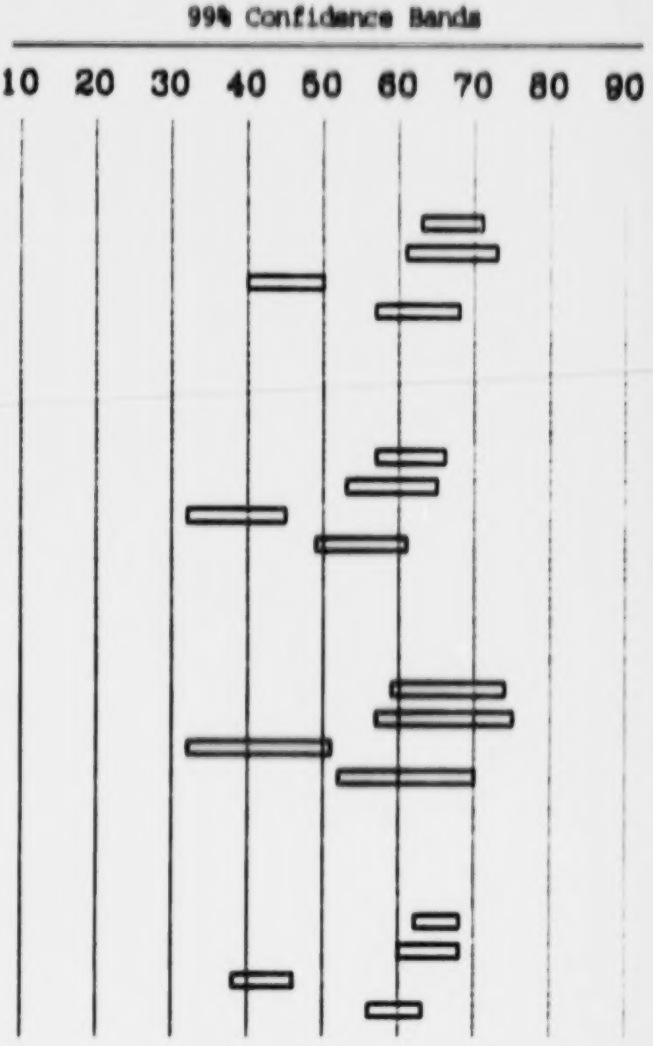


Figure 4

Percent of Items Answered Correctly for
Item Types of the Writing Skills Test, Part I

Group	Mean %	SD	99 Percent Confidence Interval
Item Type — Sentence Correction			
H.S. Seniors	67	11	63 - 71
GED Pass	67	14	61 - 73
GED Fail	45	13	40 - 50
GED Examinees	62	14	57 - 68
Item Type — Sentence Revision			
H.S. Seniors	61	10	57 - 66
GED Pass	59	13	53 - 65
GED Fail	38	14	32 - 45
GED Examinees	55	13	49 - 61
Item Type — Construction Shift			
H.S. Seniors	67	11	59 - 74
GED Pass	66	12	57 - 75
GED Fail	42	13	32 - 51
GED Examinees	61	12	52 - 70
Writing Skills — All Item Types			
H.S. Seniors	65	11	62 - 68
GED Pass	64	14	60 - 68
GED Fail	42	13	38 - 46
GED Examinees	60	13	56 - 63



Writing Skills Test, Part II (Essay Test). The essay test was scored independently by two readers. If the essay response was blank, illegible, or written on another topic than the one assigned, a score of zero was given. Essay tests receiving no score were omitted in the analysis reported in Figure 2. For the H.S. Seniors, 16.8 percent of the essay tests received zeros. For the adult GED examinees, 15.3 percent received zeros.

The essay test analysis was based upon four essay exercises taken in common by both the H.S. Seniors and the adult GED Examinees. For the Writing Skills Test, Part II, 73 percent of the adult GED Examinees were in the GED Pass group.

Again noting Figure 2, the H.S. Seniors on the average scored 5.71 points on the 2 to 12 scale on the essay test. The GED Pass group 5.36 points and the GED Fail group averaged 3.76 points. As indicated by the overlap of the confidence bands, no significant differences were noted between the groups on the essay test. Since the standard error of each group's performance was based on a small number of essay items (4 essay items), the resulting confidence bands were relatively wide-ranging and, consequently, overlapping.

Social Studies Test

For the Social Studies Test, 86 percent of the adult GED Examinees were in the GED Pass group. The GED Pass group (Mean % = 64) had a higher observed average of items answered correctly than the H.S. Seniors (58). However, as shown in Figure 5, this difference was not significant since the confidence bands overlap. Both of these groups scored significantly higher than the GED Fail group (42).

As shown in Figure 5, the significant differences noted in the Social Studies Test were consistent for three of the five content areas. For History, Political Science and Geography content areas, both the H.S. Seniors and GED Pass group significantly out-performed the GED Fail group. However, for Economics and Behavior Science (Anthropology, Psychology and Sociology) content areas, H.S. Seniors performance was not significantly different than the GED Fail group. Yet, the GED Pass group scored significantly higher than GED Fail group in all content areas.

As shown in Figure 6, the Social Studies Test was analyzed over four levels of the cognitive domain (Comprehension, Application, Analysis and Evaluation). There were no significant differences found between the H.S. Seniors and the GED Pass group on each of these cognitive levels. The H.S. Seniors scored significantly higher than the GED Fail group at both the Analysis and Evaluation levels. Since the confidence bands overlap, no significant differences in average performance can be reported for these two groups at the Comprehension and Application levels. The GED Pass group, however, out-performed the GED Fail group at each of the four cognitive levels.

Figure 5

Percent of Items Answered Correctly for
Content Areas of the Social Studies Test

Group	Mean %	SD	99 Percent Confidence Interval
Content Area — History			
H.S. Seniors	60	14	54 - 66
GED Pass	66	15	59 - 73
GED Fail	45	13	39 - 51
GED Examinees	63	14	57 - 69
Content Area — Economics			
H.S. Seniors	54	12	47 - 62
GED Pass	65	13	57 - 73
GED Fail	43	16	33 - 53
GED Examinees	61	13	53 - 70
Content Area — Political Science			
H.S. Seniors	63	12	57 - 70
GED Pass	67	16	59 - 76
GED Fail	46	17	37 - 55
GED Examinees	64	16	55 - 73
Content Area — Geography			
H.S. Seniors	58	13	51 - 65
GED Pass	59	17	49 - 68
GED Fail	38	18	28 - 47
GED Examinees	56	17	47 - 65
Content Area — Behavioral Science (Anthropology, Psychology, Sociology)			
H.S. Seniors	50	14	42 - 59
GED Pass	61	11	54 - 68
GED Fail	41	16	31 - 50
GED Examinees	59	12	52 - 66
Social Studies — All Content Areas			
H.S. Seniors	58	14	54 - 61
GED Pass	64	15	60 - 67
GED Fail	42	16	39 - 46
GED Examinees	61	15	57 - 64

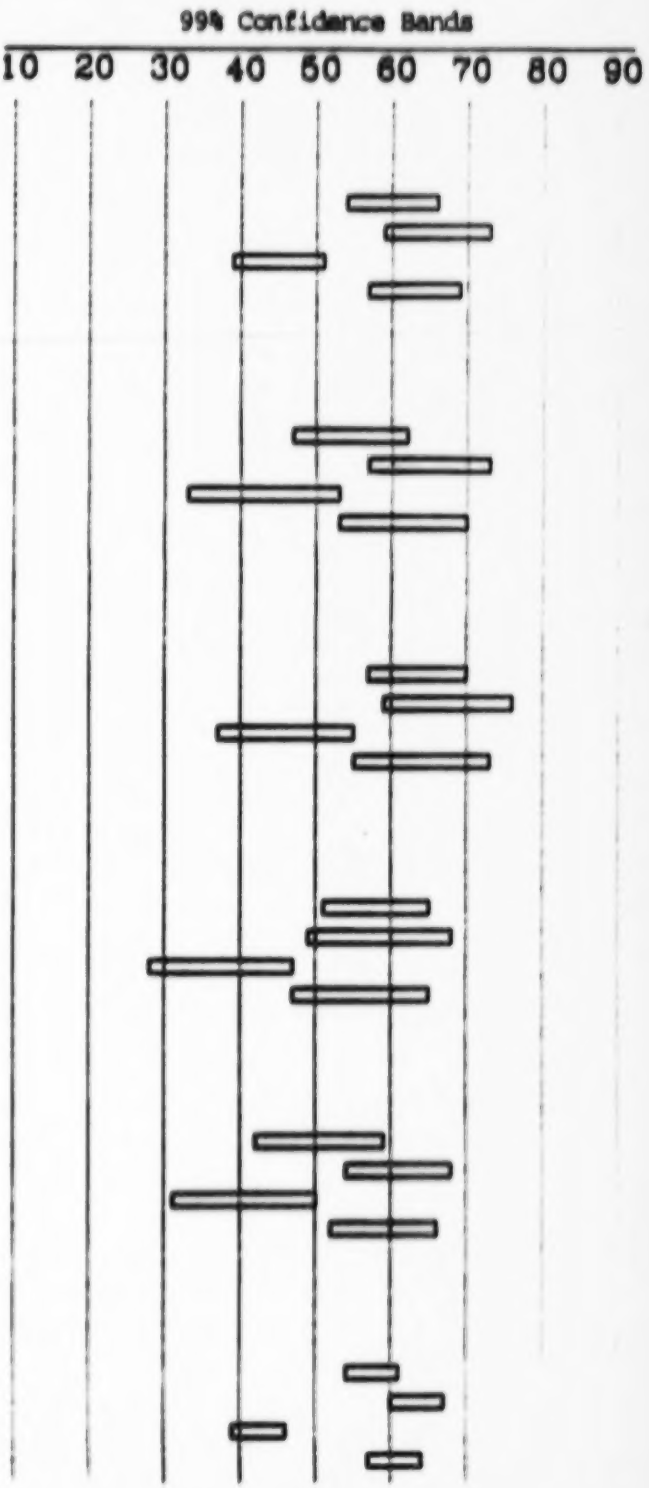
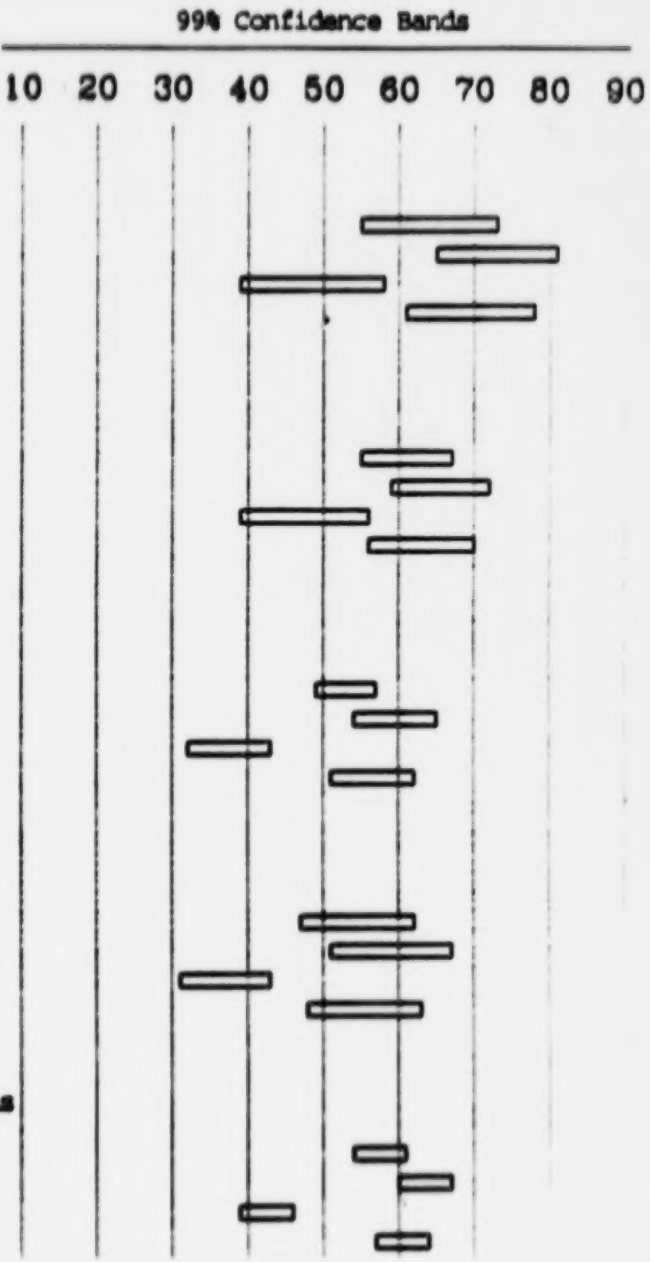


Figure 6

Percent of Items Answered Correctly for
Cognitive Levels of the Social Studies Test

Group	Mean %	SD	99 Percent Confidence Interval
Cognitive Level — Comprehension			
H.S. Seniors	64	16	55 - 73
GED Pass	73	15	65 - 81
GED Fail	49	17	39 - 58
GED Examinees	70	15	61 - 78
Cognitive Level — Application			
H.S. Seniors	61	14	55 - 67
GED Pass	66	15	59 - 72
GED Fail	48	18	39 - 56
GED Examinees	63	15	56 - 70
Cognitive Level — Analysis			
H.S. Seniors	53	9	49 - 57
GED Pass	59	13	54 - 65
GED Fail	38	13	32 - 43
GED Examinees	56	13	51 - 62
Cognitive Level — Evaluation			
H.S. Seniors	55	13	47 - 62
GED Pass	59	14	51 - 67
GED Fail	37	10	31 - 43
GED Examinees	56	13	48 - 63
Social Studies — All Cognitive Levels			
H.S. Seniors	58	14	54 - 61
GED Pass	64	15	60 - 67
GED Fail	42	16	39 - 46
GED Examinees	61	15	57 - 64



Science Test

For the Science Test, 90 percent of the adult GED Examinees were in the GED Pass group. The GED Pass group (Mean % = 65) had a higher observed average of items answered correctly then the H.S. Seniors (62). However, as shown in Figure 7, this difference was not significant. Both of these groups significantly out-performed the GED Fail group (44) on the Science Test.

As shown in Figure 7, there are no significant differences between the H.S. Seniors and GED Pass group in each of the four content areas (Biology, Earth Science, Physics and Chemistry). The H.S. Seniors significantly out-performed the GED Fail group in the content areas of Biology and Chemistry. Although the H.S. Seniors had observed averages higher than the GED Fail group in both Earth Science and Physics, no significant differences were noted because the confidence bands overlap. The GED Pass group significantly out-performed the GED Fail group in all content areas except Physics.

As shown in Figure 8, no significant differences between H.S. Seniors and the GED Pass group were found in the four cognitive levels (Comprehension, Application, Analysis and Evaluation) of the Science Test. The H.S. Seniors significantly out-performed the GED Fail group at the Application, Analysis and Evaluation levels. An observed, but nonsignificant difference was noted at the Comprehension level. The GED Pass group significantly out-performed the GED Fail group at each of the four levels of the cognitive domain.

Interpreting Literature and the Arts Test

For the Interpreting Literature and the Arts Test, 91 percent of the adult GED Examinees were in the GED Pass group. As shown in Figure 9, the GED Pass group (Mean % = 65) had a higher, but nonsignificant, observed average of items answered correctly than the H.S. Seniors (60). Both of these groups had significantly higher averages on the Interpreting Literature and the Arts Test than the GED Fail group (42).

As shown in Figure 9, no significant differences exist between the H.S. Seniors and the GED Pass group across the three content areas (Popular Literature, Classical Literature, and Commentary About Literature and the Arts) of the Interpreting Literature and the Arts Test. Both H.S. Seniors and the GED Pass group significantly out-performed the GED Fail group in each of the three content areas. As shown in Figure 10, no significant differences were noted between the H.S. Seniors and GED Pass group in three levels of the cognitive domain (Comprehension, Application and Analysis) of the Interpreting Literature and the Arts Test. The H.S. Seniors had significantly higher scores than the GED Fail group at the Comprehension and Analysis levels. An observed, but nonsignificant difference was noted at the Application level. Across the three cognitive levels, the GED Pass group significantly out-performed the GED Fail group.

Figure 7

Percent of Items Answered Correctly for Content Areas of the Science Test

Group	Mean %	SD	99 Percent Confidence Interval
Content Area — Biology			
H.S. Seniors	67	13	63 - 72
GED Pass	70	14	65 - 74
GED Fail	47	14	42 - 52
GED Examinees	67	13	63 - 72
Content Area — Earth Science			
H.S. Seniors	55	14	46 - 65
GED Pass	62	13	53 - 71
GED Fail	44	10	37 - 50
GED Examinees	60	12	52 - 69
Content Area — Physics			
H.S. Seniors	58	13	47 - 68
GED Pass	61	16	48 - 74
GED Fail	41	12	31 - 51
GED Examinees	59	15	46 - 71
Content Area — Chemistry			
H.S. Seniors	53	9	47 - 58
GED Pass	56	9	50 - 61
GED Fail	38	11	31 - 45
GED Examinees	54	9	49 - 59
Science — All Content Areas			
H.S. Seniors	62	14	58 - 66
GED Pass	65	14	62 - 69
GED Fail	44	13	41 - 48
GED Examinees	63	14	60 - 67

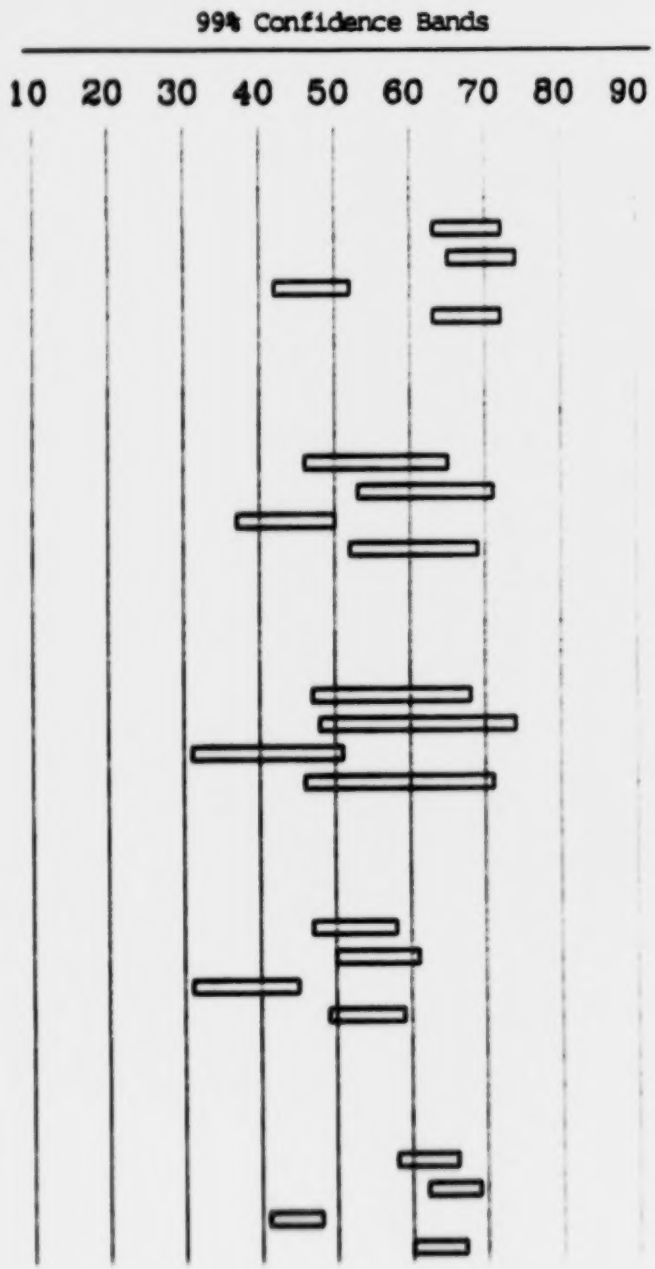


Figure 8

Percent of Items Answered Correctly for Cognitive Levels of the Science Test

Group	Mean %	SD	99 Percent Confidence Interval
Cognitive Level — Comprehension			
H.S. Seniors	65	16	55 - 76
GED Pass	72	15	62 - 82
GED Fail	46	15	35 - 56
GED Examinees	70	15	60 - 80
Cognitive Level — Application			
H.S. Seniors	65	15	58 - 72
GED Pass	65	15	59 - 72
GED Fail	46	12	41 - 52
GED Examinees	63	14	57 - 69
Cognitive Level — Analysis			
H.S. Seniors	58	13	52 - 63
GED Pass	61	13	55 - 67
GED Fail	40	13	34 - 47
GED Examinees	59	13	53 - 65
Cognitive Level — Evaluation			
H.S. Seniors	62	11	55 - 68
GED Pass	67	13	59 - 74
GED Fail	45	12	39 - 52
GED Examinees	64	12	57 - 72
Science — All Cognitive Levels			
H.S. Seniors	62	14	58 - 66
GED Pass	65	14	62 - 69
GED Fail	44	13	41 - 48
GED Examinees	63	14	60 - 67

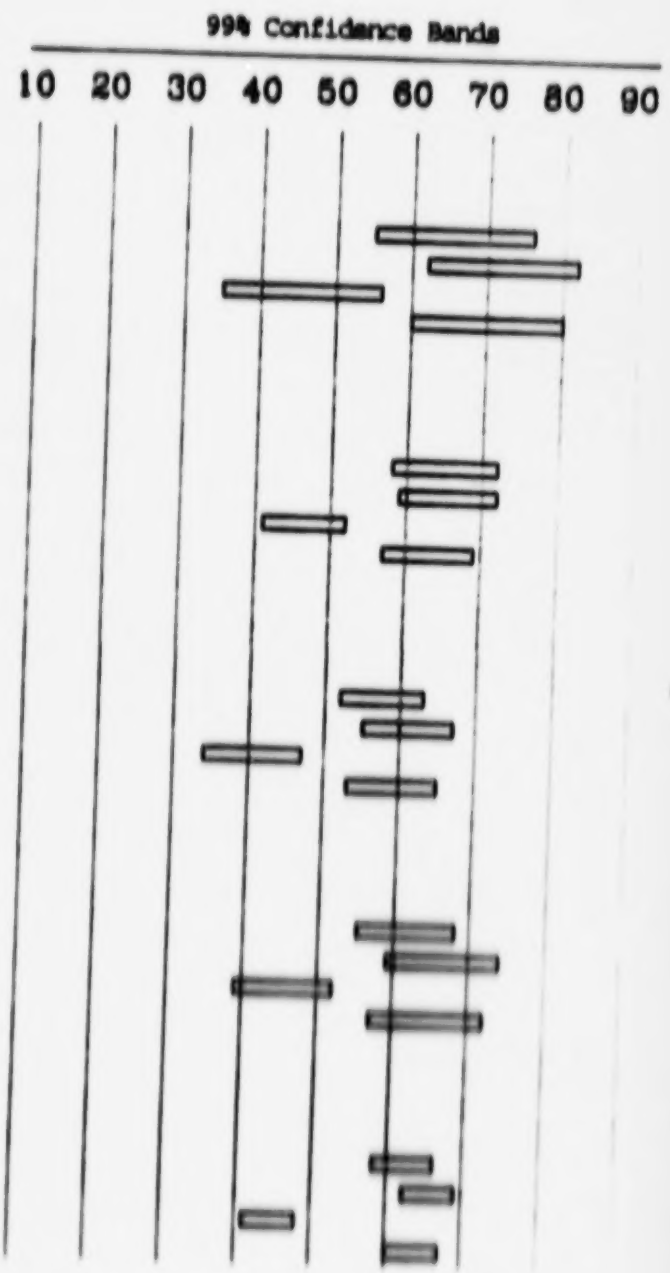


Figure 9

Percent of Items Answered Correctly for
Content Areas of the Interpreting Literature and the Arts Test

Group	Mean %	SD	99 Percent Confidence Interval
Content Area — Popular Literature			
H.S. Seniors	63	11	58 - 68
GED Pass	68	15	62 - 75
GED Fail	44	15	37 - 50
GED Examinees	66	15	59 - 72
Content Area — Classical Literature			
H.S. Seniors	60	14	53 - 67
GED Pass	66	13	59 - 72
GED Fail	40	16	32 - 48
GED Examinees	63	13	56 - 69
Content Area — Commentary About Literature and the Arts			
H.S. Seniors	58	14	51 - 65
GED Pass	61	14	53 - 68
GED Fail	42	16	34 - 50
GED Examinees	58	14	51 - 65
Interpreting Literature and the Arts — All Content Areas			
H.S. Seniors	60	13	57 - 64
GED Pass	65	15	61 - 69
GED Fail	42	15	38 - 46
GED Examinees	63	14	59 - 67

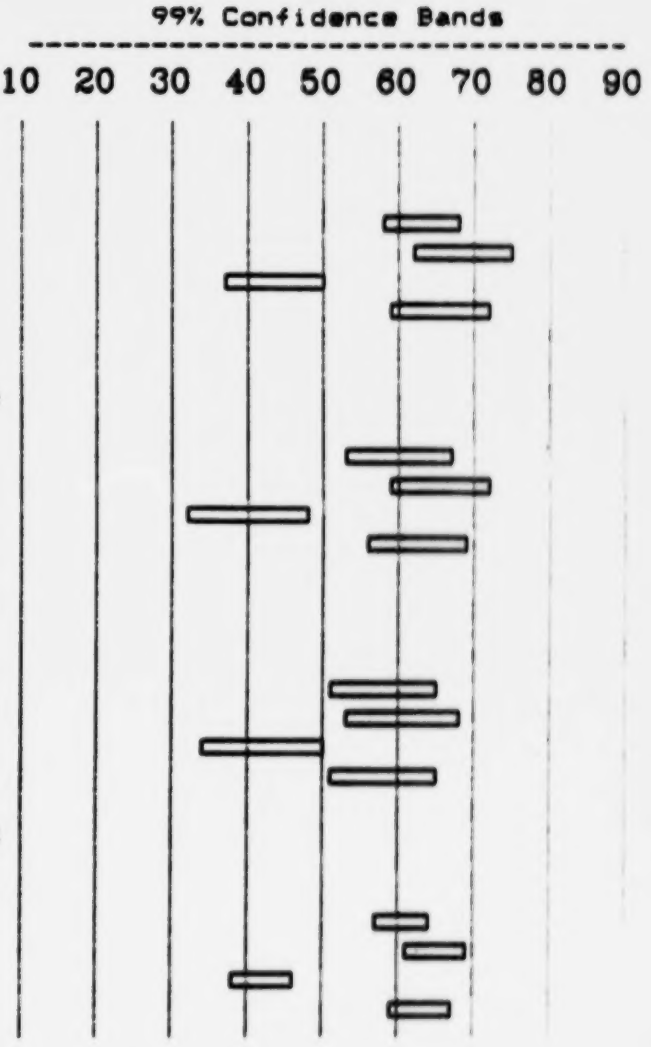
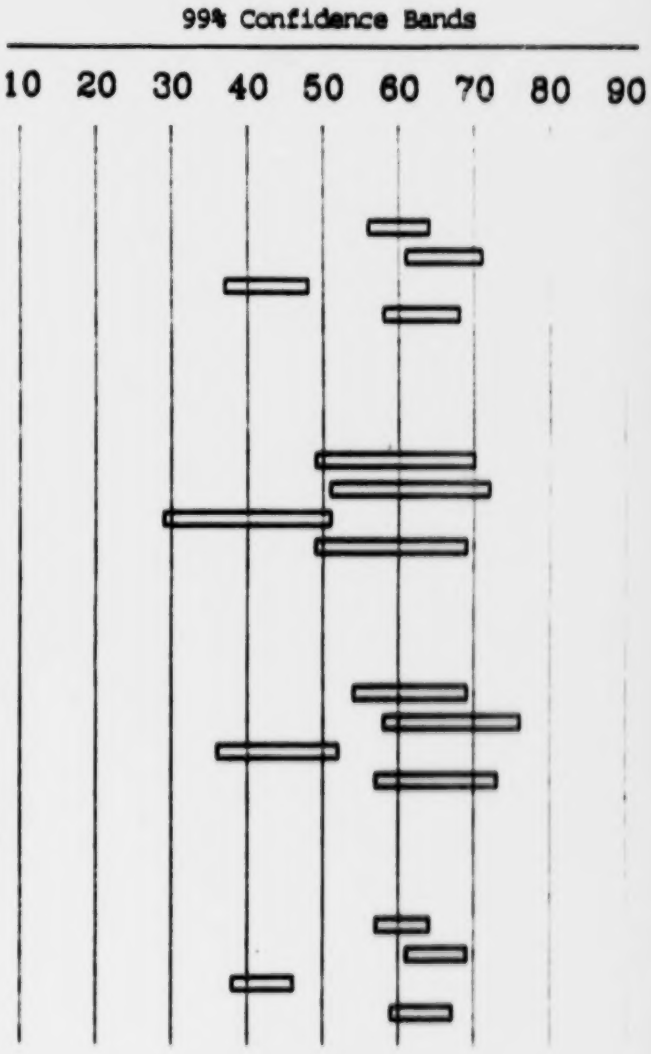


Figure 10

Percent of Items Answered Correctly for
Item Types of the Interpreting Literature and the Arts Test

Group	Mean %	SD	99 Percent Confidence Interval
Cognitive Level — Comprehension			
H.S. Seniors	60	12	56 - 64
GED Pass	66	15	61 - 71
GED Fail	42	15	37 - 48
GED Examinees	63	14	58 - 68
Cognitive Level — Application			
H.S. Seniors	59	16	49 - 70
GED Pass	61	16	51 - 72
GED Fail	40	17	29 - 51
GED Examinees	59	16	49 - 69
Cognitive Level — Analysis			
H.S. Seniors	62	13	54 - 69
GED Pass	67	15	58 - 76
GED Fail	44	13	36 - 52
GED Examinees	65	13	57 - 73
Interpreting Literature and the Arts — All Cognitive Levels			
H.S. Seniors	60	13	57 - 64
GED Pass	65	15	61 - 69
GED Fail	42	15	38 - 46
GED Examinees	63	14	59 - 67



Mathematics Test

For the Mathematics Test, 84 percent of the adult GED Examinees were in the GED Pass group. As shown in Figure 11, an observed, but nonsignificant difference was noted between the H.S. Seniors (Mean % = 63) and GED Pass group (57) in average percent of items answered correctly. Both groups significantly out-performed the GED Fail group (32).

As shown in Figure 11, across the five content areas of the Mathematics Test (Measurement, Number Relationships, Data Analysis, Algebra and Geometry), no significant differences were noted between the H.S. Seniors and GED Pass group. The H.S. Seniors significantly out-performed the GED Fail group in each of the five content areas. The GED Pass group on the average scored significantly higher than the GED Fail group in Measurement, Number Relationships and Geometry. The GED Pass group had observed, but nonsignificant higher averages than the GED Fail group in the Data Analysis and Algebra content areas.

The Mathematics Test was also analyzed by two item types: those items requiring set-up and those requiring solution. As shown in Figure 12, no significant differences were noted between the H.S. Seniors and GED Pass group across items of either type. However, the H.S. Seniors scored significantly higher than the GED Fail group on items of each type. The GED Pass group significantly out-performed the GED Fail group on Solution type items. An observed, but nonsignificant difference was noted between these two groups on Set-up type items.

Summary

Over all GED Tests, no significant differences were noted in average scores between H.S. Seniors and those GED examinees who passed the corresponding GED Test (the GED Pass group). Also, both of these groups had significantly higher average scores across all multiple choice GED Tests than those GED examinees who failed the corresponding GED Test (the GED Fail group). For the essay test no significant differences in average ratings were noted between the groups, due to large standard errors based on the small number of essay items taken in common.

Furthermore, no significant differences were found in average GED Test scores of H.S. Seniors and the GED Pass group when the multiple choice tests were broken down by content area or by cognitive level or item type. In most of these analyses, the H.S. Seniors and GED Pass group significantly out-performed the GED Fail group. The H.S. Seniors significantly out-performed the GED Fail group in 16 of the 20 content area comparisons. The GED Pass group significantly surpassed the GED Fail group in 17 of the 20 content area contrasts. For the 17 cognitive level or item type comparisons, the H.S. Seniors and GED Pass group significantly out-performed the GED Fail group in 12 and 15 contrasts, respectively.

Figure 11

Percent of Items Answered Correctly for
Content Areas of the Mathematics Test

Group	Mean %	SD	99 Percent Confidence Interval
Content Area — Measurement			
H.S. Seniors	66	13	56 - 75
GED Pass	61	18	48 - 73
GED Fail	33	14	24 - 43
GED Examinees	56	17	44 - 68
Content Area — Number Relationships			
H.S. Seniors	64	13	57 - 72
GED Pass	59	16	50 - 67
GED Fail	33	19	23 - 43
GED Examinees	55	15	46 - 63
Content Area — Data Analysis			
H.S. Seniors	58	9	50 - 66
GED Pass	45	8	38 - 52
GED Fail	30	12	19 - 40
GED Examinees	43	8	36 - 50
Content Area — Algebra			
H.S. Seniors	60	16	47 - 73
GED Pass	51	23	32 - 70
GED Fail	25	19	10 - 41
GED Examinees	48	22	30 - 66
Content Area — Geometry			
H.S. Seniors	64	13	53 - 75
GED Pass	62	11	53 - 71
GED Fail	36	16	23 - 49
GED Examinees	58	10	50 - 67
Mathematics — All Content Areas			
H.S. Seniors	63	13	59 - 67
GED Pass	57	17	51 - 62
GED Fail	32	16	27 - 37
GED Examinees	53	16	48 - 58

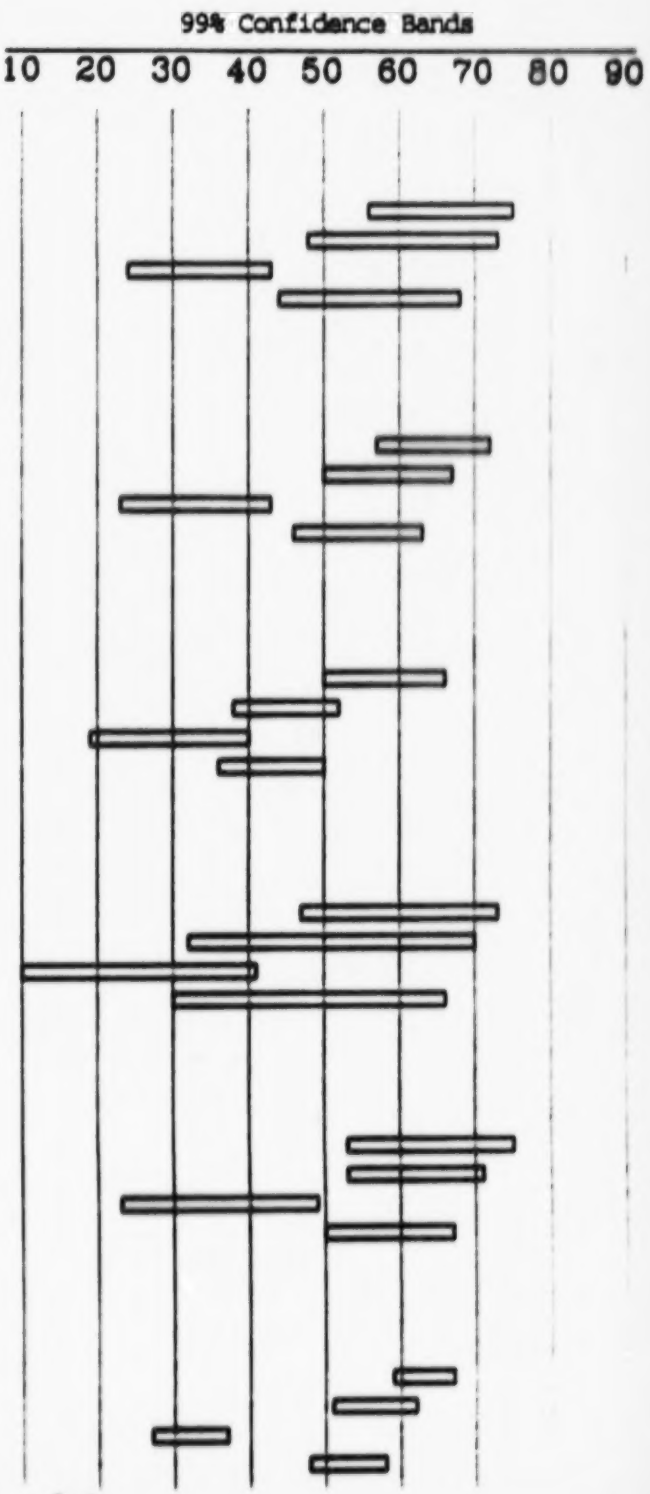
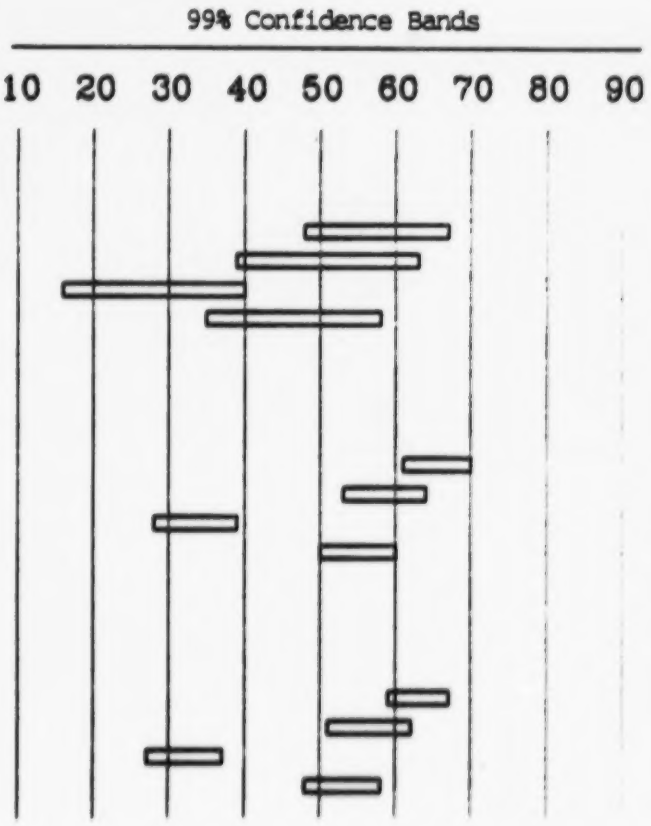


Figure 12

Percent of Items Answered Correctly for
Item Types of the Mathematics Test

Group	Mean %	SD	99 Percent Confidence Interval
Item Type — Set-up			
H.S. Seniors	58	15	48 - 67
GED Pass	51	20	39 - 63
GED Fail	28	19	16 - 40
GED Examinees	47	19	35 - 58
Item Type — Solution			
H.S. Seniors	65	12	61 - 70
GED Pass	59	15	53 - 64
GED Fail	33	15	28 - 39
GED Examinees	55	14	50 - 60
Mathematics — All Item Types			
H.S. Seniors	63	13	59 - 67
GED Pass	57	17	51 - 62
GED Fail	32	16	27 - 37
GED Examinees	53	16	48 - 58



Discussion

The present study of the 1988 GED Tests can be compared with the Malizio and Whitney (1982) study of the earlier edition. The differences will be discussed on four bases of comparison: (1) test specifications, (2) test administrations to high school seniors and GED examinees, (3) analysis of the findings, and (4) results of the studies.

For the 1988 GED Tests, all items were constructed at the comprehension level or above. That is, rote memory or knowledge level items were not included. Also, a writing section was incorporated, Writing Skills Test, Part II. In earlier editions, only multiple choice items had been used. The former Reading Skills Test was revised as the Interpreting Literature and the Arts Test to be more reflective of today's high school curriculum.

Administration of the tests to high school seniors and item sets to adult GED examinees was conducted differently than in the Malizio and Whitney (1982) study. Those participating in the present study took fewer tests and tryout items. This procedure was adopted to reduce the testing time and induce the motivation to complete the tests and item sets. None of the graduating high school seniors took the entire test battery. Generally, the seniors took the corresponding tests from the 1988 edition and the previous edition of the GED Test battery. After adult GED examinees completed the GED Test of the previous edition, they took tryout item sets rather than an entire 1988 GED Test.

Each of the GED Tests in the present study was analyzed by content area, as done in the study of the previous edition of the GED Tests (Malizio & Whitney, 1982). In the present study, each of the multiple choice tests was also analyzed by cognitive level or item type. This classification analysis was new with the 1988 GED Tests. The adult GED examinees were further divided into GED Pass and GED Fail groups determined by a criterion standard score of 40 on the corresponding GED Test. The GED Pass group was determined differently and the GED Fail group results were not included in the Malizio and Whitney (1982) study.

The findings of this study are generally consistent with the earlier study by Malizio and Whitney (1982): the GED Pass group performed similarly to the graduating high school seniors on the GED Tests. However, due to changes in the tests, in the administrations of the items, and in the analysis procedures, the results are not directly comparable.

Conclusion

The policy of awarding high school credentials for performance on the 1988 GED Tests is based upon: (1) the test validity, (2) groups selected for comparison, and (3) comparable performance. First, the level of content validity of the tests is a result of guidance by national advisory committees and technical development by professional test service personnel. Second, sampling procedures were followed for selection of high school seniors and adult GED examinees to produce representative samples of the two populations. Third, comparable performance was noted between the GED Pass group and graduating H.S. Seniors on all tests, as no statistical differences between these two groups were observed. For these reasons, this study substantiates the use of the 1988 GED Tests for awarding high school diploma equivalency credentials.

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Appendix

Samples of Adult GED Examinees Taking Tryout Items from the 1988 GED Tests

Spring, 1985	Fall, 1985	Spring, 1986
Indiana	Massachusetts	Alabama
Minnesota	Arizona	Indiana
New Mexico	Nevada	Minnesota
Nebraska	Maine	New Mexico
Hawaii	Delaware	New York
Vermont	South Carolina	North Carolina
Rhode Island	Tennessee	Oklahoma
West Virginia	Mississippi	Washington
Colorado	Wisconsin	Wyoming
Idaho	Alaska	
Georgia	New Hampshire	
Michigan	Connecticut	
South Dakota	Ohio	
Kansas	Kentucky	
Montana	Louisiana	
Utah	California	